

# 2017 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska

December 2016



**NOAA**  
**FISHERIES**

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## Contents

Executive Summary .....	4
Introduction .....	6
Purpose and Authority .....	6
Process and Schedule .....	6
Annual Report Summary .....	7
2017 Deployment Methods .....	8
At-Sea Deployment Design .....	9
Selection Pools (Stratification) .....	9
Projected Allocation of At-Sea Deployment (Sample Size) .....	10
Salmon Bycatch Sampling in the Gulf of Alaska .....	11
Conditional Release Policy .....	12
Annual Requests for Full Coverage on BSAI Trawl Catcher Vessels .....	12
Observer Declare and Deploy System (ODDS) .....	13
eLandings Electronic Reporting System .....	13
Communication and Outreach .....	13
References .....	14
List of Preparers and Contributors .....	16
Appendix A - Council motions on the Annual Report and Draft 2017 ADP .....	17
Council motion from June 9, 2016, on agenda item C-1 Observer Annual Report .....	17
Council motion from October 7, 2016, on agenda item C-4 Observer Annual Deployment Plan .....	18
Appendix B – Calculation of the Selection Rate for the final 2017 Annual Deployment Plan .....	19
Introduction .....	19
Methods and Results .....	19
Changes from last year .....	19
Data preparation .....	20
Estimation of fishing effort in 2017 .....	20
Determining deployment rates for 2017 .....	20
Discussion .....	22
Literature Cited .....	23
Appendix C – Summary of Electronic Monitoring (EM) Pool for 2017 .....	29
EM Selection Pool .....	29
Qualifying Criteria & Process .....	29
EM Pool Size .....	30

## Executive Summary

This Annual Deployment Plan (ADP) documents how the National Marine Fisheries Service (NMFS) intends to assign fishery observers to vessels fishing in the North Pacific during the calendar year 2017.

- NMFS will use the trip-selection method (i.e., the trip-selection pool) to assign observers to vessels in 2017.
- In the 2015 Annual Report, NMFS recommended and the Council supported (Appendix A) evaluating two additional strata for the 2017 ADP: 1) vessels delivering to tenders; and 2) partial coverage catcher-processors. Based on the analysis of alternative deployment strategies, the draft 2017 ADP recommended (NMFS 2016a), and the Council supported (Appendix A), a stratification scheme based on gear and tender deliveries.
- NMFS will implement the following sampling strata for 2017:
  - Hook-and-line vessels greater than or equal to 40 feet (ft) length overall (LOA)
  - Hook-and-line vessels greater than or equal to 40 ft LOA delivering to tenders
  - Pot vessels greater than or equal to 40 ft LOA
  - Pot vessels greater than or equal to 40 ft LOA delivering to tenders
  - Trawl vessels
  - Trawl vessels delivering to tenders
- The “no-selection pool,” which is the pool of vessels that will have no probability of carrying an observer on any trips for the 2017 fishing season, will be composed of two categories:
  - Catcher vessels less than 40 ft LOA and vessels fishing with jig gear.
  - Electronic monitoring (EM) selection pool: Fixed gear vessels that have opted-in to the EM selection pool and will participate in the 2017 EM cooperative research described in the 2017 EM pre-implementation plan (see Appendix C).
- NMFS will use the optimal allocation based on discarded groundfish (NMFS 2016a). To determine the deployment rate for each stratum, NMFS estimated a budget for available sea-days and anticipated fishing effort (Appendix B). The at-sea budget for the deployment of observers was set at 3,127 days and deployment rates<sup>1</sup> for the strata in 2017 are—
  - No selection – 0%
  - Hook-and-line – 11%
  - Tender hook-and-line – 25%
  - Pot – 4%
  - Tender Pot – 4%
  - Trawl – 18%
  - Tender trawl – 14%

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<sup>1</sup> Deployment rates are rounded to the nearest whole number. For more specific rates, see Appendix B.

- NMFS will maintain the ability for vessels to log three trips in advance of fishing in the Observer Declare and Deploy System (ODDS). In addition, for vessels 40 ft to 57.5 ft LOA fishing non-trawl gear, the programming in ODDS to automatically release a trip from observer coverage if the two previous trips were randomly selected will remain in place for 2017 (i.e., if two trips in a row were observed and a third trip is selected, then the third trip will be released from coverage).
- NMFS will continue to collect genetic samples from salmon caught as bycatch in groundfish fisheries to support efforts to identify stock of origin. The sampling protocol established in the 2014 ADP will be used in 2017.
- NMFS will not grant conditional releases or temporary exemptions to vessels subject to observer coverage and, similar to 2016, will continue to mitigate the impact of observers on vessels through the 2017 EM pre-implementation plan. This plan specifies that qualifying vessels that volunteered for EM participation are not required to carry an observer.
- In 2016, NMFS published new regulations to allow the owner of a trawl catcher vessel to annually request that NMFS place the vessel in the full coverage category for all directed fishing for groundfish using trawl gear in the Bering Sea and Aleutian Islands management area (BSAI) in the following calendar year. This regulated process has replaced an interim policy. For the 2017 calendar year, NMFS received and approved requests and has placed 31 catcher vessels in the full coverage category for all directed fishing for groundfish using trawl gear in the BSAI management area.
- NMFS will continue to communicate the details of the ADP to affected participants through letters, public meetings, and posting information on the internet. Outreach activities during 2016/2017 fall and winter will focus on changes to observer deployment in the 2017 ADP and the ongoing work to integrate a regulated EM component into the North Pacific Observer Program (Observer Program).

## Introduction

### Purpose and Authority

This 2017 Annual Deployment Plan (ADP) documents how the National Marine Fisheries Service (NMFS) intends to assign at-sea and shoreside observers to vessels and processing plants engaged in fishing operations in the North Pacific under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP), the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA FMP), and the Northern Pacific Halibut Act of 1982.

Data collection by observers is currently the only reliable and verifiable method available for NMFS to gain fishery discard and biological information on fish, and data concerning seabird and marine mammal interactions with fisheries. Onboard observers also perform the critically important task of collecting biological data such as species composition, weights, and tissue samples that are important for stock assessment scientists and researchers. Much of this information is expeditiously available to ensure effective management.

Details on the legal authority and purpose of the ADP are found in the Final Rule for Amendment 86 to the BSAI FMP and Amendment 76 to the GOA FMP (77 FR 70062, November 21, 2012). The ADP is a core element in implementation of section 313 of the MSA (16 U.S.C 1862), which authorizes the North Pacific Fishery Management Council (Council) to prepare a fisheries research plan that requires the deployment of observers into the North Pacific fisheries and establishes a system of fees. The ADP describes the science-driven method for observer deployment to support statistically reliable data collection that includes species identification, quantification and disposition of catch, documentation of interactions with marine mammals and seabirds, and collection of biological specimens to support research and assessment of biological resources in the North Pacific. This ADP specifically describes the observer deployment methods that will be used for the partial coverage category (50 CFR 679.51(a)) in the halibut and groundfish fisheries during 2017.

### Process and Schedule

NMFS and the Council created the ADP process to provide flexibility in the deployment of observers to gather reliable data for estimation of catch in the groundfish and halibut fisheries off Alaska. NMFS and the Council recognized that the amount of observer coverage available for any given year would be dependent on available revenue generated from fees on groundfish and halibut landings. The ADP process allows NMFS to adjust deployment in each year so that sampling can be achieved within financial constraints. Some aspects of observer deployment can be adjusted through the ADP, including the assignment of vessels to a specific partial coverage selection pool, and the allocation strategy used to deploy observers in the partial coverage category.

The ADP process ensures that the best available information is used to evaluate deployment, including scientific review and Council input, to annually determine deployment methods. NMFS annually develops an ADP to describe how observers will be deployed for the upcoming calendar

year and prepares an annual report that evaluates the performance of the prior year's ADP implementation. The schedule for the 2017 ADP is as follows:

- June 2016: NMFS presented the 2015 Annual Report to the Council and the public (NMFS 2016b). The 2015 Annual Report provided a comprehensive evaluation of Observer Program performance including costs, sampling levels, issues, and potential changes for the 2017 ADP. The 2015 Annual Report identified areas where improvements are needed to 1) collect the data necessary to manage the groundfish and halibut fisheries, 2) maintain the scientific goal of unbiased data collection, and 3) accomplish the most effective and efficient use of the funds collected through the observer fees. This review informed the Council and the public about how well various aspects of the program are working.
- September 2016: Based on information and analyses from the 2015 Annual Report (NMFS 2016b) and Council recommendations (Appendix A), NMFS prepared and released the Draft 2017 ADP (NMFS 2016a) containing recommendations for deployment methods in the partial coverage category. The Council's Observer Advisory Committee and Groundfish Plan Teams reviewed the Draft 2017 ADP.
- October 2016: The Council and its Scientific and Statistical Committee reviewed the Draft 2017 ADP and associated Groundfish Plan Team and Observer Advisory Committee recommendations. The Council provided recommendations for the final 2017 ADP (Appendix A).
- October – December 2016: NMFS finalizes the 2017 ADP and releases it to the public prior to the December 2016 Council meeting.

The analysis and evaluation of the data collected by observers and the ADP development is an ongoing process; in June 2017, NMFS will present the 2016 Annual Report that will form the basis for the 2018 ADP.

## Annual Report Summary

As described in the previous section, NMFS releases an annual report in June of each year that evaluates observer deployment under the ADP and includes an overview of the fees and budget associated with deployment, enforcement of the Observer Program regulations, a summary of public outreach events, and a scientific evaluation of observer deployment conducted by the Observer Science Committee (OSC) (e.g., Faunce et al. 2016). NMFS has released three annual reports starting with the 2013 Annual Report (NMFS 2014a), which was presented to the Council in June 2014, and most recently the 2015 Annual Report (NMFS 2016b), which was presented to the Council in June 2016. This 2017 ADP builds on NMFS recommendations in the three annual reports and input from the Council (Appendix A).

In both the 2013 and 2014 Annual Reports (NMFS 2014a; 2015c), NMFS evaluated the deployment method and concluded that the trip-selection process was working well, whereas the vessel-

selection process had several problems. Based on these evaluations, NMFS recommended that participants in the vessel-selection pool be placed in the trip-selection pool, and this recommendation was implemented under the 2015 and 2016<sup>2</sup> ADPs (NMFS 2014b; 2015a). NMFS will continue to use the trip-selection method for all vessels in 2017.

The annual reports have evaluated observer deployment in each of the sampling strata for each year. The strata definitions in the 2013 and 2014 ADPs were based on gear and vessel size where all trawl vessels and fixed gear vessels greater than 57.5 ft length over all (LOA) were placed in one stratum, and all fixed gear vessels from 40 to 57.5 ft LOA were placed in a separate stratum. In the 2014 Annual Report, the OSC recommended exploring new strata definitions based on gear and FMP area (NMFS 2015c). They also noted that it would be important that sampling strata are defined by characteristics that are known before the trip begins and that each trip can be assigned to a single stratum at the time the trip is logged. Based on the analysis of 12 alternative designs in the Draft 2016 ADP (NMFS 2015b, Faunce 2015a), NMFS implemented a design in 2016 with three sampling strata and samples allocated according to a blended optimal allocation based on both retained and discarded catch.

In the 2015 Annual Report, NMFS recommended and the Council reiterated (Appendix A) that the gear-specific sampling strata (trawl, hook-and-line, and pot) defined in 2016, should be continued in 2017. In addition, NMFS recommended evaluating additional strata based on 1) vessels delivering to tenders, and 2) partial coverage catcher-processors. The Draft 2017 ADP (NMFS 2016a Appendix B) provided an analysis of the performance of four alternative sampling designs defined by gear, whether catch was delivered to a tender, and a partial coverage catcher-processor stratum.

Recognizing the challenging logistics of putting observers on small vessels and low levels of catch by these vessels, NMFS has placed vessels less than 40 ft LOA and jig vessels in the no-selection pool for observer coverage since 2013. However, the 2014 and 2015 Annual Reports (NMFS 2016b; 2015c) and the supplement to the environmental assessment for the restructured Observer Program (NMFS 2015d) have highlighted the data gaps caused by not having any observer information on vessels less than 40 ft LOA. In recognition of both the challenging logistics and data gaps, NMFS will continue to place vessels less than 40 ft LOA in the no-selection pool in 2017 and recommends that, in the future, vessels less than 40 ft LOA be considered for testing of electronic monitoring.

## 2017 Deployment Methods

The Observer Program uses a stratified hierarchical sampling design where strata are defined through a combination of regulations and the annual deployment process. A multi-stage sampling design is used to sample the species composition of catch along with other catch components, such as biological information that is important for stock assessments. Both shoreside sampling methods and at-sea sample collections are nested within a trip-based observer deployment.

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<sup>2</sup> Vessels participating in the EM selection pool used a vessel-selection method in 2016, but will use the trip-selection method in 2017.



## At-Sea Deployment Design

The sampling design for at-sea deployment of observers involves two elements: 1) how the population of partial coverage trips is divided (stratification) into selection pools or strata; and 2) what proportion of the total observer deployments are to occur within these divisions (allocation).

### Selection Pools (Stratification)

The Draft 2017 ADP analyzed the performance of alternative sampling designs defined by gear and tender or non-tender deliveries, and partial coverage catcher-processor strata (NMFS 2016a). The designs were evaluated using gap analysis (i.e., exploring situations where no observer data would be available). The gap analysis was used to determine which sampling designs would have a 50 percent probability of having at least one and three observed trips. The gaps associated with each design were compared to provide a relative ranking of sampling designs. The gap analysis found that gear and tender/non-tender stratification scheme more often outperformed the gear and partial coverage catcher-processor stratification scheme.

In 2017, the following observer deployment strata will be in place for vessels in the partial observer coverage category (50 CFR 679.51(a)):

- ***No-selection pool:*** The no-selection pool is composed of vessels that will have no probability of carrying an observer on any trips for the 2017 fishing season. These vessels are divided into two categories:
  - Fixed gear vessels less than 40 ft LOA<sup>3</sup> and vessels fishing with jig gear, which includes handline, jig, troll, and dinglebar troll gear.
  - Electronic monitoring (EM) selection pool: Fixed gear vessels that have opted-in to the EM selection pool and will participate in the EM cooperative research described in the 2017 EM pre-implementation plan (see Appendix C).
- ***Trip-selection Pool:*** A random selection of trips, termed trip-selection, will be the sole method of assigning observers to at-sea fishing events in 2017. There are six sampling strata in the trip-selection pool:
  - Hook-and-line: All vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing hook-and-line gear and are not delivering to tenders.
  - Pot: All vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing pot gear and are not delivering to tenders.

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<sup>3</sup> Length overall (LOA) is defined in regulations at 50 CFR 679.2 and means the centerline longitudinal distance, rounded to the nearest foot.

- Trawl: All catcher vessels in the partial coverage category fishing trawl gear and are not delivering to tenders.
- Hook-and-line vessels delivering to tenders: All vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing hook-and-line gear and are delivering to tendering vessels.
- Pot vessels delivering to tenders: All vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing pot gear and are delivering to tendering vessels.
- Trawl vessels delivering to tenders: All catcher vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing trawl gear and are delivering to tendering vessels.

### **Projected Allocation of At-Sea Deployment (Sample Size)**

There are three elements that NMFS uses to determine selection rates for at-sea deployment of observers: 1) the allocation scheme to determine the proportion of deployments that will occur in each sampling pool; 2) estimates of anticipated fishing effort; and 3) available sea-day budget.

The Draft 2017 ADP evaluated two optimal allocation methods to determine the proportion of deployments that will occur in each sampling stratum (NMFS 2016a). Based on this analysis, NMFS proposed and the Council agreed (Appendix A) to use the optimal allocation based on discarded groundfish rather than the optimal allocation based on retained groundfish or a blend of optimal allocations based separately on retained and discarded groundfish. This decision was based on the fact that observer data are considered the most reliable source of information on bycatch (NMFS 2011).

The second piece of information used to determine deployment rates was an estimate of anticipated fishing effort. Appendix B provides an analysis of trends of past fishing effort and an estimation of anticipated effort for 2017. In this analysis, trends in past fishing effort were used to evaluate the assumption that the most recent year of past fishing effort would be the best proxy for future fishing effort. The total number of fishing days and trips in the partial coverage fleet were compared among years from 2013 through 2016, and based on these results, the fishing effort in 2015 was used as a proxy for fishing effort for 2017.

The final element used to determine deployment rates was the anticipated budget for the upcoming year. NMFS anticipates the budget for 2017 deployment to be approximately \$3.6M, using projected revenue from the fees for the 2016 calendar year.<sup>4</sup> This budget is lower than the \$3.9M

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<sup>4</sup> As in previous years, funding the partial coverage contract is contingent upon the Office of Management and Budget releasing observer fee collections in time to fund the next option period. The partial coverage observer contract awarded to AIS in April 15, 2015, was for a year and four option years. The observer fees became available at the end of May, and the first year was funded on June 17, 2015, to cover the period from June 17, 2015, to June 16, 2016. Additional option years must be awarded by June 17 of each year to fund the following year's observer sea days. Since the contract years span calendar years, funding for sea days from

that was projected in the draft 2017 ADP (NMFS 2016a) and reflects updated information about projected fees. Using this updated budget information the at-sea budget for the deployment of observers is set at 3,121 days.

NMFS uses the estimates of anticipated fishing effort and available sea-day budget as the primary inputs into simulation models used to generate anticipated outcomes from different selection rates. Sample size and resulting coverage rate estimates were generated through simulation following the approach used for previous ADPs in which each simulation trial mimics an ADP selection draw for the year (Appendix B). Each vessel in the sampling strata of the partial-coverage fleet does not undertake identical numbers of trips and days in a year; the simulation approach provides NMFS with a full range of potential outcomes from random sampling (selections) of different vessels and trips. The simulated deployment rate was determined from an evaluation of estimated annual program costs assessed against the risk of exceeding the Observer Program's available funds. NMFS estimates that 785 trips will be observed for 2017 in the partial coverage category (

Table 1). The deployment rates (rounded to the nearest whole number) for the trip-selection pool in 2017 are—

- Hook-and-line – 11%
- Tender hook-and-line – 25%
- Pot – 4%
- Tender Pot – 4%
- Trawl – 18%
- Tender trawl – 14%

Table 1. Summary of allocation weights, deployment rates, and the number of trips expected to be observed in each stratum in 2017. See Appendix B for more detail.

Stratum	Allocation Weight	Deployment Rate (%)	Number of trips expected to be observed
No-selection	0.000	0	0
Hook-and-line	0.367	11.09	288
Tender Hook-and-line	0.002	25.00	2
Pot	0.041	3.88	32
Tender Pot	0.008	3.92	6
Trawl	0.551	17.57	433
Tender trawl	0.031	14.29	24
Total	1.000		785

### Salmon Bycatch Sampling in the Gulf of Alaska

Genetic sampling of salmon in the GOA remains a priority for NMFS in 2017. This priority follows the implementation of Amendment 93 to the GOA FMP (77 FR 42629, July 20, 2012), which

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January 1 through June 16 2017 is included on the current year's contract for which funds have already been obligated, and sea days from June 17 through December 31, 2017, will be purchased under a new option year on the contract on June 17, 2017.

required all vessels fishing for pollock in the central and western GOA to retain salmon until delivery to a processing facility. There have been several iterations of the sampling design used to obtain genetic samples from salmon bycatch for the purposes of stock of origin (Faunce 2015b).

The sampling protocol for salmon that was established in the 2014 ADP (NMFS 2013) and continued under the 2015 and 2016 ADPs (NMFS 2014b, 2015a) will remain in effect for 2017. Trips that are randomly selected for observer coverage in the GOA pollock fishery will be completely monitored for salmon bycatch by the vessel observer during offload of the catch at the shoreside processing facility, and genetic tissues to support stock of origin research (e.g., Guyon et al. 2015) will be collected systematically from Chinook salmon and Chum salmon. Outside of the pollock fisheries, tissues will be obtained from all salmon found within observer at-sea samples of the total catch.

### **Conditional Release Policy**

For 2017, NMFS will not grant any conditional releases or temporary exemptions to any vessels subject to observer coverage. The expansion of the EM selection pool in 2017 (Appendix C) is a mitigating factor in NMFS' recommendation to not grant any temporary exemptions. For hook-and-line vessels, the Council endorsed the expansion of the vessels in the EM selection pool in 2017 to 90 vessels of any length. First priority in this pool will continue to be given to small longline vessels (40 to 57.5 ft LOA) and vessels that have life raft or bunk space limitations with carrying an observer. The Council also endorsed EM pre-implementation deployment on 30 pot vessels of any length for 2017 (pot vessels were not included in EM pre-implementation prior to 2017). Vessels in the EM selection pool will carry EM equipment as described in the 2017 EM pre-implementation plan, but will not be subject to carrying an observer.

### **Annual Requests for Full Coverage on BSAI Trawl Catcher Vessels**

Since 2013, NMFS has provided, through policy, a mechanism to enable trawl vessels to carry an observer at all times when fishing in the BSAI. In 2016, NMFS published new regulations<sup>5</sup> to allow the owner of a trawl catcher vessel to annually request that NMFS place the vessel in the full observer coverage category for all directed fishing for groundfish using trawl gear in the BSAI in the following calendar year (81 FR 67113, September 30, 2016). This regulated process has replaced the interim policy. Vessels moved from partial coverage to full coverage will no longer contribute to the observer fee that funds partial coverage since full-coverage vessels fund observer coverage under a pay-as-you-go model.

For the 2017 calendar year, NMFS received and approved requests and has placed 31 catcher vessels<sup>6</sup> in the full observer coverage category for all directed fishing for groundfish using trawl gear in the BSAI management area.

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<sup>5</sup> <https://alaskafisheries.noaa.gov/sites/default/files/81fr67113.pdf>

<sup>6</sup> <https://alaskafisheries.noaa.gov/sites/default/files/2017obscoveragebsaitrawlcvt.pdf>

## **Observer Declare and Deploy System (ODDS)**

Trip selection is facilitated through the Observer Declare and Deploy System (ODDS). Vessel operators log their trips into ODDS by either using a website (<http://odds.afsc.noaa.gov>) or by calling AIS at the ODDS call center at 855-747-6377. For 2017, NMFS is not changing ODDS, other than programming different selection rates for different gear types and for different gear types delivering to tenders.

Vessel operators will still be allowed to cancel or change any unobserved trips (logged trips that have not been selected for observer coverage) themselves, but any changes to observed trips (logged trips that have been selected for observer coverage) need to be coordinated by contacting the ODDS call center. Vessel operators should ensure that the intended delivery location (tender versus shoreside) recorded in ODDS matches the actual delivery location. If, in unusual circumstances, a vessel operator needs to change the delivery type during a trip, then they must contact AIS to modify the delivery location.

NMFS will retain the current business operating procedure of allowing vessel operators to log up to three trips in advance. Any observed trip that is canceled will automatically be inherited on the next logged trip. In addition, NMFS will maintain programming that releases the third consecutively selected trip from observer coverage for fixed gear vessels 40 ft to 57.5 ft LOA.

## **eLandings Electronic Reporting System**

NMFS modified the eLandings system in 2016 to enable the ODDS trip number to be entered on groundfish landing reports in eLandings. When vessel operators log trips in ODDS, they are given an ODDS trip receipt with a unique trip number. When landing reports are entered in eLandings at the end of the trip, the vessel operators are asked to provide their ODDS trip number so that it can be entered on the landing report. Having ODDS trip numbers entered on groundfish landing reports facilitates data analysis and provides better linkage between ODDS and eLandings. However, in 2016, we did not achieve complete reporting. In 2017, NMFS will provide further outreach to processors to increase reporting of the ODDS trip number.

## **Communication and Outreach**

NMFS will continue to communicate the details of the ADP to affected participants through letters, public meetings, and information on the internet:

- Information about the Observer Program is available at <https://alaskafisheries.noaa.gov/fisheries/observer-program>.
- Frequently Asked Questions are available at <https://alaskafisheries.noaa.gov/sites/default/files/2016-observer-prog-faq.pdf>.
- For Frequently Asked Questions regarding ODDS, go to <http://odds.afsc.noaa.gov> and click the “ODDS FAQ” button.

Several outreach activities are planned for the winter/spring of 2016/2017 to inform industry participants of changes to observer deployment in the 2017 ADP. The dates and meeting locations

are listed in Table 2. Observer Program staff are also available for outreach meetings upon request by teleconference and/or WebEx pending staff availability and local interest. A community partner would be needed to organize a location and any necessary equipment to facilitate additional meetings. To request a meeting or suggest a topic for discussion, please contact Chris Rilling at 1-206-526-4194.

Table 2. Public outreach meeting locations and schedule.

Location	Date
Seattle, Pacific Marine Expo	November 17–19, 2016
Aleutians East Borough Fishermen meeting	December 2016
Kodiak, ComFish	April 2017

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## **Appendix A - Council motions on the Annual Report and Draft 2017 ADP**

### **Council motion from June 9, 2016, on agenda item C-1 Observer Annual Report**

- 1) The Council recommends that the draft 2017 Annual Deployment Plan evaluate the following:
  - Maintain dockside monitoring on pollock deliveries.
  - Continue to place vessels under 40ft in the no selection pool.
  - Continue to place vessels participating in the 2017 EM pre-implementation program into no selection pool, using the priority and number of vessels that will be determined through the EM workgroup and Council process.
  - Maintain the 3 sampling strata defined by gear in 2017 and continue to use the optimal allocation to evaluate deployment rates while trying to maintain the expectation of at least 3 observed trips in each NMFS area.
  - Continue to allow vessels to log 3 trips at a time in ODDS, and providing automatic release from coverage for the third observed trip for vessels 40-57.5 ft in length.
  - Two additional strata for Council review in the 2017 draft ADP: 1) vessels delivering to tenders; and 2) partial coverage catcher-processors.
- 2) The Council recommends that NMFS incorporate the following in future annual reports:
  - Continue to track trips by both gear type and vessel size categories (e.g., Table 4-1 in the 2015 annual report)
  - Provide an examination of observer sampling results (such as percent of hauls sampled versus total hauls per trip, and sample fractions by vessel type, size, and gear size) in Chapter 4, or as a separate report.
  - Include information on debriefing times for full coverage observers.
  - Continue to incorporate evaluation of the EM strata
- 3) The Council continues to express concern about the timeliness of the release from US Treasury of observer fees and the fact that timely distribution of the fees is critical to maintaining coverage throughout the year.
- 4) The Council encourages the agency to continue work on developing variance methods, incorporating recommendations from the SSC.

The Council also moves to write a letter to the National Marine Fishery Service thanking the agency for their financial support of the observer program and outlining the number of observer days and coverage rates that have been achieved. In addition, the letter would outline possible declines in observer days if additional federal funding is not received, and would request additional funding to maintain approximately the same number of annual observer days through the development and full integration of electronic monitoring in the observer program.

Finally, the Council requests NMFS postpone action on AIS's application to be a full coverage observer provider until getting input from the Council after they have received the October white paper on LL2 observer issues that will include looking at the impacts of an observer provider being in the partial and full coverage categories in terms of (1) confidential fisheries information; (2) reimbursements by the Federal government; and (3) other unfair competitive advantages.

## **Council motion from October 7, 2016, on agenda item C-4 Observer Annual Deployment Plan**

The Council supports the following recommendations for the draft 2017 Annual Deployment Plan:

- Use the trip-selection method to assign observers to vessels in partial coverage in 2017.
- Deploy observers in the trip selection pools defined by gear and tender, with optimal allocation based on discarded catch. Support the preliminary deployment rates resulting from this stratification:
  - Hook-and-line (11%)
  - Tender hook-and-line (27%)
  - Pot (3%)
  - Tender Pot (6%)
  - Trawl (18%)
  - Tender Trawl (14%)
- The no selection pool would include catcher vessels 1) less than 40 ft and vessels fishing with jig gear, and 2) vessels that have opted-in to the EM selection pool and will participate in the 2017 EM pre-implementation plan.
- No temporary exemptions from observer coverage are allowed due to insufficient life raft capacity, given the option for vessels to be in the electronic monitoring pool in 2017.
- Continue the policy (programming in ODDS) that prevents a 40 – 57.5' fixed gear vessel from being selected for a third consecutive observer trip.
- Maintain the ability for vessels to log up to three trips in advance in ODDS.
- Continue to encourage ODDS trip number to be entered on groundfish landing reports to facilitate data analysis and provide a better link between ODDS and eLandings.
- Maintain the current Chinook salmon sampling protocols to identify stock of origin.

Continue to conduct outreach in fall and winter 2016/2017 as appropriate, focusing on the new tender strata. In addition, the Council requests that more information about logging trips in the tender strata be included in the final 2017 ADP.

For the draft 2018 ADP, the Council requests that Observer Program staff include prioritization of PSC limited fisheries in the weighting schemes for optimal allocation of coverage.

The Council recommends that NMFS continue development of performance metrics to evaluate both the deployment performance and the reliability of the catch and bycatch estimates, including calculating the variances associated with point estimates, and as part of the annual report and ADP process.

Finally, the Council recommends that NMFS begin to consider approaches to address low coverage rates that include the following: (1) finding efficiencies within the existing sampling design, and (2) evaluating the present fee structure.

## **Appendix B – Calculation of the Selection Rate for the final 2017 Annual Deployment Plan**

### **Introduction**

The 2017 Annual Deployment Plan (ADP) specifies that the method known as “trip-selection” be the sole method of assigning observers within the ‘partial-coverage’ category of the fleet (i.e., the portion that is sampled at the trip-level of the sampling design hierarchy used by the North Pacific Observer Program). Trip-selection is accomplished through the Observer Declare and Deploy System (ODDS). Trip-selection participants are sent a letter prior to the start of the calendar year with their username and password so that they may access the ODDS and log planned fishing trips. Each logged trip is assigned a random number of four digits ranging from 0 to 1 (e.g., 0.0000, 0.1234, 1.0000, etc.). This random number is evaluated against a pre-programmed selection rate in ODDS. If the random number is below or equal to the selection rate, then a trip is selected for observation. For this reason, two key elements of the sampling design are required to be known before fishing begins in a given calendar year: (1) how fishing activities are divided into groups for the purposes of observer deployment (hereafter termed strata), and (2) the selection rate for each strata in which trips are going to be logged.

The Draft 2017 ADP contained an evaluation of alternative stratum definitions and sample allocations for the deployment of observers into the partial-coverage fleet (NMFS 2016). The analysis that follows is based on the decisions made by the North Pacific Fishery Management Council (NPFMC) at their October 2016 meeting regarding the Draft 2017 ADP. The sample design for observer deployment for the Draft 2017 ADP was defined in units of trips belonging to one of to six strata (defined by combinations of three gear types and whether or not a trip delivers catch to a tendering vessel), with sample size weightings among the strata determined by an optimal allocation strategy based on discarded catch (hereafter termed ‘allocation weightings’, NPFMC 2016). Allocation weightings are not the same as deployment rates. Allocation weightings sum to 1 and reflect the proportion of the total number of observed trips that should occur in each stratum. The following analysis uses updated catch histories as a proxy for future fishing effort, updated budgets for observer deployments, and determines appropriate sampling rates for each stratum for the final 2017 ADP.

### **Methods and Results**

#### **Changes from last year**

All analyses were performed using the R language for statistical computing (R Core Team, 2016) following the same general procedures and operating under the same general assumptions used in previous Annual Deployment Plans. These include the selection of appropriate deployment rates and the generation of “risk-profiles” of going over budget. In both the Draft 2017 ADP and this analysis the budget for 2017 is set so that the ADP is economically solvent without Federal Funds through June 16, 2020 given stable fee collection funding each year and a fixed travel budget. However, instead of using the same sample allocation weightings as the Draft 2017 ADP, this analysis includes the recalculation of sample allocation weightings following the same methods (NMFS 2016). This methodology change was deemed appropriate given that there were substantial

changes to the underlying structure of the partial-coverage fleet<sup>7</sup> and anticipated budgets in 2017 since the Draft 2017 ADP (Table 3). Details of the methods used in this analysis are contained in the following sections.

### **Data preparation**

Data developed by the staff of the Sustainable Fisheries Division of the Alaska Regional Office (AKRO) and the Fisheries Monitoring Division (FMA) of the Alaska Fisheries Science Center for the Draft 2017 Annual Report were used in this analysis. Briefly, these data consist of species-specific catch amounts, fishing dates, locations, catch disposition, observation status, and associated draft 2017 ADP strata. As in past ADPs, trip data were altered to reflect the expected fishing under partial coverage in the upcoming year. For the final 2017 ADP these alterations include: (1) adding an additional day to trips that occurred in the trawl pollock fishery to account for the additional cost of monitoring associated offloads for salmon bycatch and genetic tissue collections<sup>8</sup>, (2) fishing activity by seven ‘historical low volume’ Catcher-Processors were labeled as belonging to the partial-coverage category, (3) fishing by eligible trawl vessels in the BSAI were relabeled as belonging to the full coverage fleet if they indicated this was their preferred coverage for this activity in 2017, and (4) vessels with no probability of selection were removed from the analysis following the 2017 Draft ADP (i.e., all trips corresponding to hook and line and pot gear on vessels < 40’ LOA, vessels fishing jig gear, and vessels that volunteered to participate in electronic monitoring in 2017).

### **Estimation of fishing effort in 2017**

In this analysis, trends in past fishing effort were used to inform decisions as to whether or not to accept the assumption that the most recent year of past fishing effort would be the best proxy for future fishing effort. The total number of fishing days and trips that would qualify as belonging to the partial coverage fleet of 2017 were compared among years 2013-2016 (Figure 1). Although trends in annual fishing effort by trawl vessels had been evidenced during 2013-2015, effort through November 1<sup>st</sup> in 2016 did not extend this trend. Based on the results of Figure 1 and review by the Observer Science Committee<sup>9</sup>, fishing effort in 2015 was used as a proxy for fishing effort in 2017 (POP17).

### **Determining deployment rates for 2017**

The selection rate that can be afforded in the coming year depends on several factors. These include the amount of fishing that is expected to occur and the available budget. In both the Draft 2017 ADP and this analysis, the budget for 2017 was set so that the ADP is economically solvent without Federal Funds through June 16, 2020, given stable fee collection funding each year and a fixed travel budget. These extrapolations result in a total number of 3,121 observer days for each calendar year during that time period (Table 3). This new expected annual number of sea-days represents a 36.3% decline from the number of days expected to be observed in 2016 (4,900)<sup>10</sup>.

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<sup>7</sup> This is due to the fact that the deadline for participation is November 15<sup>th</sup>- after the Draft ADP is reviewed.

<sup>8</sup> More details on observer sampling methods for salmon bycatch in Faunce (2015).

<sup>9</sup> Jason Gasper (AKRO), Jennifer Cahalan (PSFMC), Ray Webster (IPHC), Steve Barbeaux (AFSC), Sandra Lowe (AFSC), and Craig Faunce (AFSC).

<sup>10</sup> From the Final 2016 ADP (NMFS 2015).

Unlike past ADPs, here optimal sample allocation weightings for each stratum were recalculated following the methods of the 2017 Draft ADP (NMFS 2016). This change was warranted given changes in group membership between this and the draft version of the 2017 ADP (Table 3). Sample allocation is the term for how available observer deployments are apportioned to strata. “Optimal” allocation is that which achieves the most precision for the least cost ( $c$ ). If  $n$  is the number of observed trips afforded for the year among all partial coverage fishing trips ( $N$ ) that occur within  $H$  strata, and the estimate of catch from these trips has  $S^2$  variance, the number of samples that is considered optimum for each stratum ( $n_h$ ) is denoted by the product of the total sample size and the optimal weighting ( $W_{hopt}$ ),

$$n_h = n * W_{hopt}, \text{ where } W_{hopt} = \frac{N_h S_h / \sqrt{c_h}}{\sum_{h=1}^H (N_h S_h / \sqrt{c_h})} \text{ (Cochran 1977)}, \quad \text{Eq. (1)}$$

The partial coverage contract of the observer program pays for observer days according to the intersection of two variables: fixed costs for each deployment day, and variable costs in terms of transportation. While the fixed cost component of observer days are known and equal between deployments of observers, variable costs are not. However, there is a portion of the contract between NMFS and its partial-coverage observer provider that accounts for travel costs for the year. Assuming this cost is fully utilized, the monies available for observer deployment become total funds ( $C$ ) minus travel costs ( $C_T$ ). Likewise, because not all trips are of equal duration, the cost of an observed trip in each stratum ( $c_h$ ) can be derived from the multiplication of its average trip duration and the cost of an observer day. While Equation 1 gives the allocation of observed trips among strata, it does not give the total sample size. To obtain this we can rearrange equation 1 as

$$n = \frac{(C - C_T) \sum_{h=1}^H (N_h S_h / \sqrt{c_h})}{\sum_{h=1}^H (N_h S_h \sqrt{c_h})} \text{ (Cochran 1977)}. \quad \text{Eq. (2)}$$

Once equation 2 is solved, the value for  $n$  can then be used to solve for the sample size (trips) in each stratum using Equation 1. The resulting coverage rate in each stratum is obtained from the division of  $n_h$  by  $N_h$ . Following the Draft 2017 ADP, past fishing effort from 2014 and 2015 (with updated strata membership) were used in aggregate to obtain optimal sample size weightings for each stratum and total number of trips afforded from Equations 1 and 2.

As in past ADPs, the analysis of potential deployment rates was conducted through iterative simulated sampling of proxy trips representing the upcoming year (here POP17 is represented by 2015 with updated stratum membership). Initial total samples sizes were determined from Equation 2. Stratified random sampling without replacement of the POP17 trip data with sample sizes for each stratum set equal to  $n_h$  constituted one trial of one simulation. In each trial, the total number of days in sampled trips was summed for both the first half of the year (for NMFS contracting and budget considerations) and for the entire year, and compared to the available sea-days for the entire year. A total of 1,000 trials were conducted for each simulation.

Since the initial values of  $n_h$  represent the number of trips afforded if each trip is of equal length and executions are perfect, it represents an overly optimistic total sample size. Therefore, seven versions of the simulations were conducted. In each successive simulation (hereafter termed ‘increments’), the total number of trips that could be sampled was incrementally reduced by 2 and 1,000 new trials were conducted and days sampled for the first half and entire year compiled and compared to available budgets for 2017.

The results from each simulation increment are presented in Figure 2. **Based on these results, the rates resulting from the fourth increment are recommended for use in the final 2017 ADP since they represent rates that, on average, should result in a minimum number of remaining days in the available budget for the first half of the year, and are a compromise between the risk of deploying at rates that result in the observer program spending more-or-less than available budgets.** The distribution of expected budgets for the first half of the year and the full year of 2017 from the selected iteration are presented in Figure 3. For clarity, the resulting rates and the expected number of observed trips in each stratum are presented in Table 4. It is estimated that 785 trips totaling 3,127 days will be observed in 2017 (with 1,680 days occurring between January 1 and June 16, 2017). This compares with 887 trips and 3,505 days estimated in the Draft 2017 ADP.

The expected difference between the available budget and the expended budget under iteration 4 and Table 4B is depicted as a risk-profile in Figure 4. The average and most likely sea-day expenditure for 2017 is expected to be \$5,361 over budget with the possibility of being between \$128,372 under budget and \$178,024 over budget.

## Discussion

Coverage rates are presented here are lower in every stratum from the values presented in the Draft 2017 ADP. This outcome results from a variety of factors that include a reduced fee revenue projection, differences in vessel participation in voluntary strata, and updated allocation weightings. The relative impact of these elements can be inferred from the results in the tables. From Table 3 we know that total observer days declined by 36.3%. Changes in the total number of trips and allocation weightings between Table 4A and Table 4B reflect changes due to differences in vessel participation in voluntary strata. The largest differences in sample allocation weightings were evident in the Hook-and-line + Tender and Pot + Tender strata where they decreased by over 40%. In comparison, sample allocation weightings decreased by 5.3% in the hook-and-line stratum, decreased by 1.8% in the Pot stratum and increased by 5.4% in the Trawl stratum and increased by 2.6% in the Trawl + Tender stratum. These results imply that a substantial variance of discarded catch and cost (the drivers of sample allocation) once contained within the hook-and-line + Tender and Pot + Tender strata is now contained within the EM voluntary stratum. An evaluation of alternative stratum compositions within the partial coverage fleet including EM is expected to be prepared by the NMFS and reviewed by the Observer Science Committee in 2017.

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Table 3. Differences in observer deployment budgets, participation in voluntary strata, and total coverage afforded between the 2017 Draft ADP and this analysis. The numbers of vessels participating in voluntary coverage was estimated for the Draft 2017 ADP, whereas actual volunteers are known in this analysis (as of November 29rd, 2016).

	<b>Draft 2017 ADP</b>	<b>This analysis</b>
Total anticipated cost of observer deployment	\$3,970,952	\$3,641,363
Trawl vessels volunteering for 100% coverage when BSAI fishing	21	31
Vessels volunteering for Electronic Monitoring	76	90
Observer sea-days afforded	3,505	3,121

Table 4. Results of sample size allocation weightings and resultant sample sizes from the (A) Draft 2017 ADP and (B) this analysis. The columns ‘Low’ and ‘High’ are values for days observed that represent the lower and upper 95 percentiles from 1,000 simulated samples of fishing trips (trials). These high and low values were not reported in the Draft 2017 ADP.<sup>11</sup> HAL = Hook and Line.

Strata	Total Trips	Observed Trips	Optimal weighting	Coverage Rate	Days Observed		
					Low	Mean	High
A. Draft 2017 ADP							
HAL	2,790	344	0.388	12.33		1,649	
Pot	979	37	0.042	3.78		128	
Trawl	2,370	464	0.523	19.58		1,541	
HAL + Tender	10	3	0.004	30.00		12	
Pot + Tender	183	12	0.014	6.56		50	
Trawl + Tender	168	27	0.030	16.07		125	
B. This analysis							
HAL	2,596	288	0.367	11.09	1,320	1,405	1,501
Pot	825	32	0.041	3.88	95	107	121
Trawl	2,464	433	0.551	17.57	1,425	1,460	1,492
HAL + Tender	8	2	0.002	25.00	5	8	13
Pot + Tender	153	6	0.008	3.92	14	27	55
Trawl + Tender	168	24	0.031	14.29	76	119	168

<sup>11</sup> The sum of Mean Days Observed in B is 3,126 (and does not total to 3,127 cited in the text) since values in this table are rounded to whole numbers.



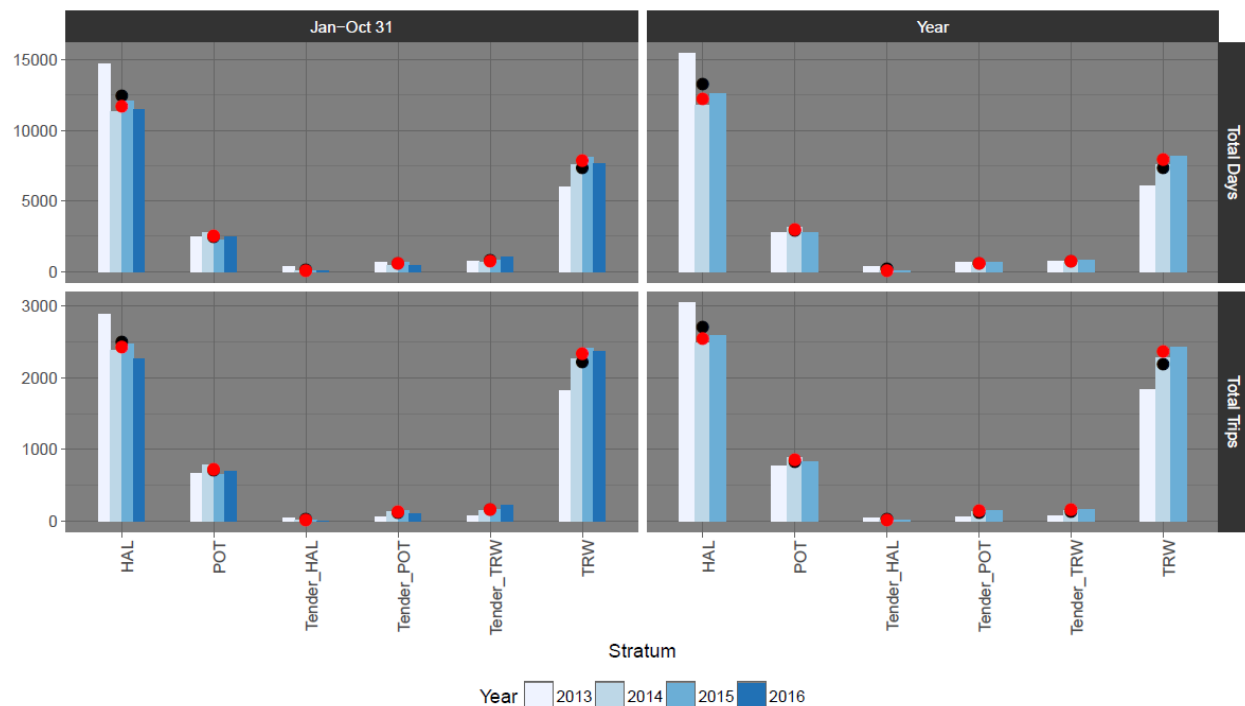


Figure 1. Trends in partial coverage fishing effort by the six strata defined in the Draft 2017 ADP (HAL = hook and line, POT = pot gear, TRW = trawl gear, Tender = trips delivering to a tender) over various time periods to evaluate changes between the most recent full year and the current year. Red dots denote means from the two most recent years used in evaluating the 2017 Draft ADP, while black dots denote means across all years.

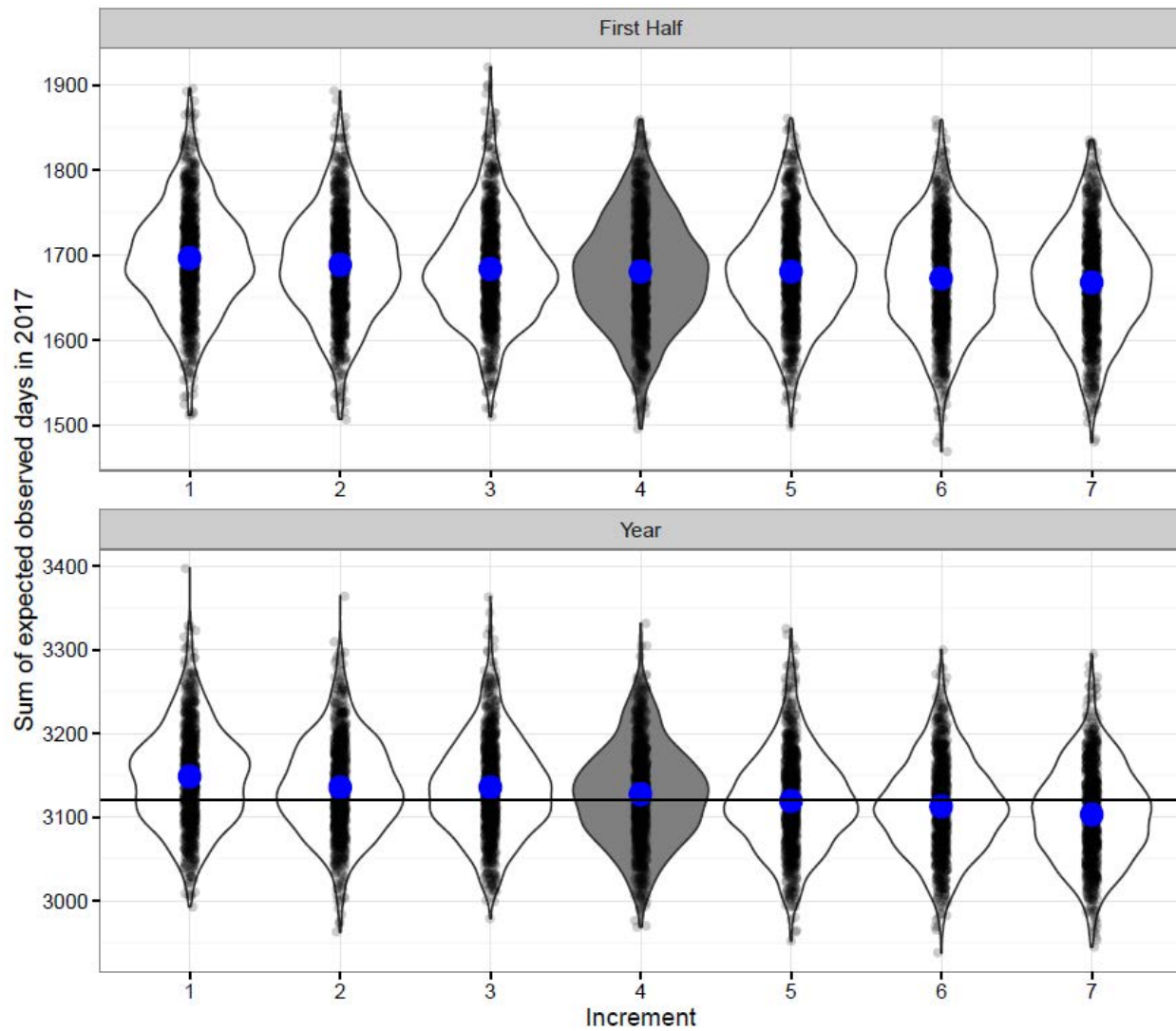


Figure 2. The total number of days expected to be observed in the first half of 2017 (top panel) and the entire calendar year of 2017 (bottom panel) for seven incremental decreases in the total number of trips in which observers were deployed. For each increment, the outcome of a single trial is depicted as a black dot. The average of the 1,000 trials for each increment are depicted as blue dots. The number of outcomes are expressed by the width of the oval for each increment. In this way, the mean is a good approximation of the most likely outcome. The black horizontal line represents the available budget.

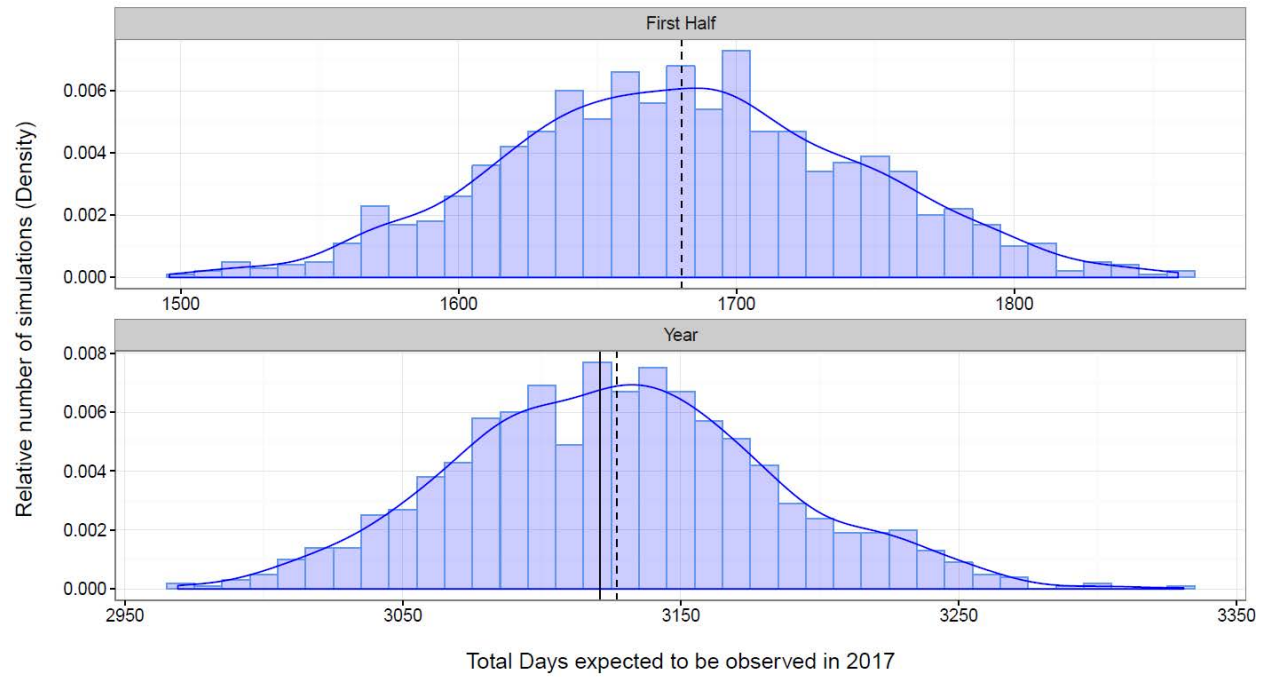


Figure 3. Summary of 1,000 outcomes of simulated sampling from the preferred increment (increment 4) showing the number of observed days expected for the first half (top panel) and entire year of 2017 (lower panel). Dashed lines denote average outcomes from the simulations while the solid black line depicts the number of days corresponding to the available budget.

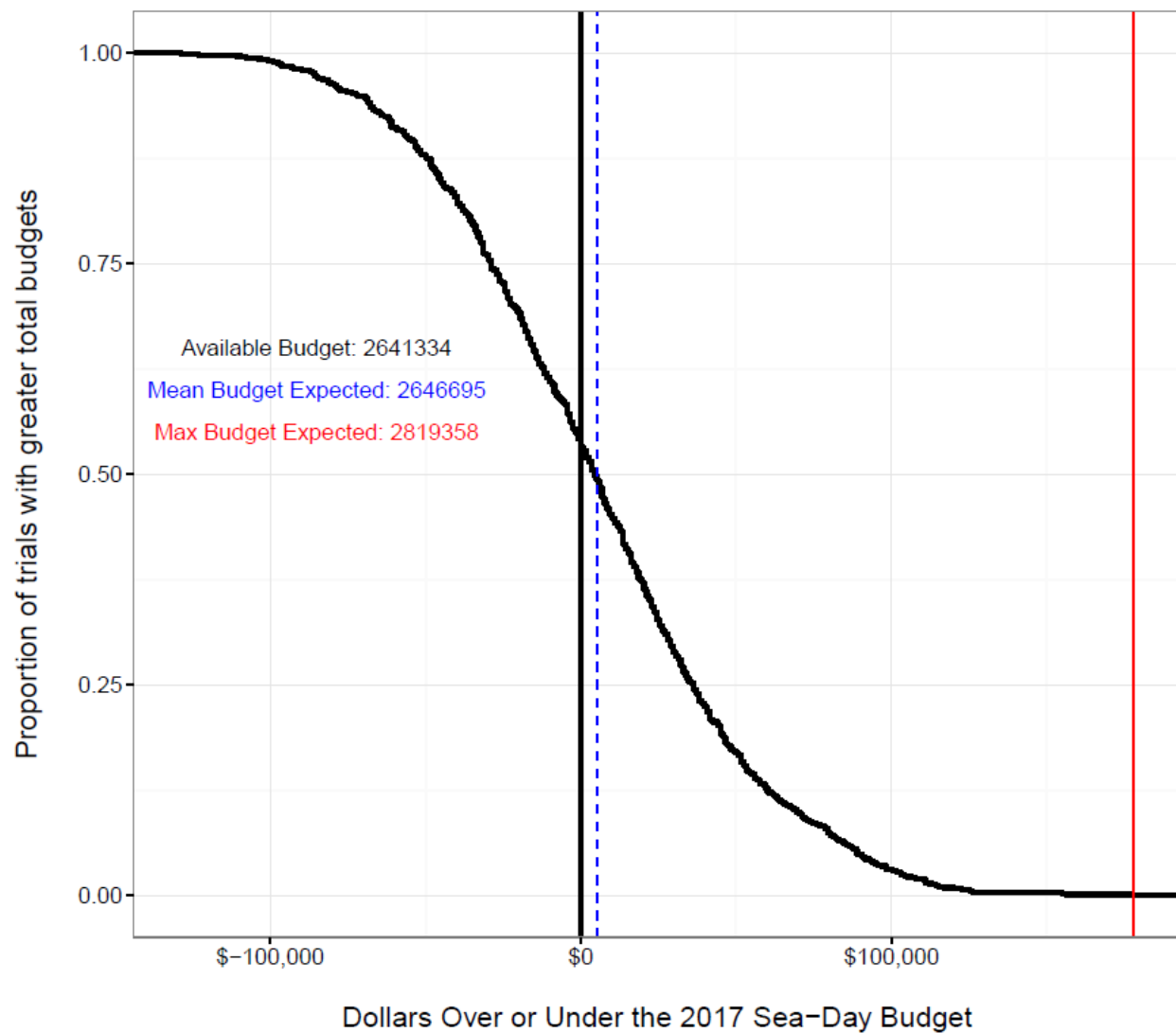


Figure 4. The risk profile showing the proportion of 1,000 trials from the selected simulation increment with annual observer day budgets greater than and lower than the available budget of 3,121 days. The mean outcome is depicted in the blue dashed line, the available budget is depicted by the black solid line, and the maximum outcome is depicted by the vertical red line to the right.

## Appendix C – Summary of Electronic Monitoring (EM) Pool for 2017

The North Pacific Fishery Management Council (Council) has established an intention to integrate electronic monitoring (EM) tools into the Observer Program for the fixed gear groundfish and halibut fisheries. The Council's intent is to develop EM to collect data to be used in catch estimation for this fleet. As part of this process, EM implementation procedures are being developed and refined through a Council committee, the fixed gear EM Workgroup (EMWG). The EMWG provides a forum for all stakeholders, including the commercial fishing industry, agencies, and EM service providers, to cooperatively and collaboratively design, test, and develop EM systems, consistent with the Council goal to integrate EM into the Observer Program.

In October 2016, the Council approved a draft 2017 EM pre-implementation plan that was developed by the EMWG. This appendix summarizes some elements of the draft EM pre-implementation plan that affect the ADP.

More information on the EMWG and the draft EM pre-implementation plan is available on the Council's website: <http://www.npfmc.org/observer-program/>.

### EM Selection Pool

The EM selection pool in 2017 will include vessels that meet the Council's criteria for EM, and who opt into the EM pool. Not all vessels in the EM selection pool will carry cameras for all of their fishing activity. Vessels that opted into the EM selection pool in 2016 needed to "opt-in" again for 2017.

### Qualifying Criteria & Process

**Criteria:** The 2017 EM selection pool is open to vessels greater than 40' LOA using hook and line and pot gear. First priority was given to vessels 40-57.5 feet length overall where carrying a human observer is problematic, due to bunk space or life raft limitations.

**Process:** In May 2016, NMFS sent letters to all hook and line vessels and pot vessels, regardless of vessel length, requesting them to opt-in to the EM selection pool if they were interested in carrying EM systems in 2017<sup>12</sup>. NMFS requested that vessels indicate their interest by September 20, 2016. After the October 2016 Council meeting, which included a discussion of the EM Pre-implementation Plan, a second letter specifying the rules governing EM deployment for 2017 was sent to vessels that had expressed interest. After receiving this second letter and reviewing the requirements for volunteering, vessels could choose to contact NMFS and "opt out" of the EM program, in which case they were returned to the human observer pool.

Additions to the EM pool from vessels not meeting the September 20, 2016, deadline were considered on a case-by-case basis relative to the qualifying criteria and available funding.

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<sup>12</sup>[http://www.npfmc.org/wp-content/PDFdocuments/conservation\\_issues/Observer/EM/2017%20EM%20Selection%20Pool%20Opt%20In%20Letter%20final%20sent%20May%2027.pdf](http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/2017%20EM%20Selection%20Pool%20Opt%20In%20Letter%20final%20sent%20May%2027.pdf)

**EM Pool Size**

The EM workgroup proposed and the Council approved a maximum of 90 hook-and-line vessels and a maximum of 30 pot vessels be allowed to participate in the EM selection pool in 2017.

A total of 96 vessels opted into the EM pool for 2017 cooperative research; 73 vessels primarily fishing with longline gear, 18 vessels fishing with pot gear, and 5 vessels with stereo camera systems. All of these vessels will be placed in the no selection pool for the duration of the 2017 season. It should be noted that the analysis included in Appendix B of this document was based on 90 vessels; however additional vessels were placed in the EM pool after the Opt-In deadline had passed and the analysis was completed.